Customer Energy Savings - for Fall Newsletter
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As you prepare your buildings for the approaching heating season, we would like to take this opportunity to present to you a few suggestions on saving energy this winter. Energy conservation is beneficial for everyone. In addition to saving you money, energy conservation reduces the consumption of hydrocarbon-based fuels and reduces the amount of greenhouse gas emissions. We hope the following list proves helpful to you this heating season.

Faulty steam traps - Steam traps are located in everyone's building and throughout the DES. They are used to separate the moisture condensed in the steam pipes from the steam. Typically, the outlet of all of the steam traps are piped to a condensate receiver where the condensate is collected and pumped back to through the EDS (Energy Distribution System) to the EGF (Energy Generating Facility; central plant). When steam traps fail, they will often allow steam to pass through the orifice and into the condensate piping. Occasionally, a failed steam trap will leak steam from its bonnet or connection points into the mechanical room. Evidence of faulty steam traps include steam leaks at the traps, themselves, or excessive steaming from the condensate receiver (some steaming due to the evaporation of the condensate can be expected). A single faulty trap could cause a loss in steam flow rate of approximately 50 pounds per hour - steam that you bought but from which you received no benefit. This flow rate could cost as much as $600 per month per defective trap! Each piece of equipment receiving steam will require a steam trap; therefore, having 10 to 20 traps within your building is a real possibility. Inspect your steam traps regularly and make sure they are all functioning properly.

Steam leaks - Steam leaks are easy to spot, but they can be even more costly than faulty traps. Steam leaks typically occur at flanges and threaded connections due to a loose connection or damaged gaskets or at a damaged section of pipe. Steam leaks can be very dangerous to personnel and may cause property damage if left unchecked. A small steam leak, especially in a high pressure line, will soon become a large steam leak as the high velocity steam erodes an even greater hole in the pipe, fitting or flange. A one-eighth of an inch diameter hole can begin leaking at a rate of approximately 25 pounds per hour. Although the cost of the lost steam may only be around $300 per month at this rate, this flow rate will not last long! The hole will become larger and costs will mount with an increased steam loss and increased damage to the pipe, fitting, valve or flange that you will eventually have to replace. Inspect your piping regularly and repair any steam leaks as soon as possible.

Missing or damaged insulation - The insulation on your steam piping, valves, fittings, tanks and equipment decreases the heat loss from the device. You may not consider the insulation very important, but it is! The heat loss from steam piping to the room causes some of the steam in the pipe to condense. This condensed moisture is removed from the piping via the steam traps, thus this condensate is steam that you bought but that left your heating system before it did any heating! You will have to replace every pound of steam that condenses with another pound of

steam, thus increasing your heating costs. In addition, exposed hot surfaces caused by a lack of insulation can create a hazard to your personnel. The surface of a bare section of high pressure steam pipe can be over 250°F! Some heat loss will always occur in your steam piping, but you can minimize those losses by maintaining your insulation or insulate pipe or equipment that has not traditionally been insulated.

Controls and control valves - Control valves stick. Pilots fail on pressure regulators. Linkages break. But you knew that already, didn't you? You should regularly inspect your control valves at your coils or heat exchangers to make sure they are stroking properly. You may also want to inspect your dampers, especially if you have an economizer cycle on any of your air handlers, to make certain that they are opening and closing when they are supposed to - and only then. Stuck valves and dampers can be a hindrance to your operation but may also be a source of energy loss. Outside air dampers that are stuck open will greatly increase the steam required at a coil on a cold day. Similarly, control valves that are stuck open allow steam to pass through your coils uncontrollably. These energy losses are difficult to quantify and vary between units, but they can be costly! Your control system (your EMS) can also be a source of energy loss if your thermostat settings are not correct or are not responding properly. You may also want to make sure that your controls for cooling are working properly at the proper setpoints. It is not unusual for some buildings to have high chilled water usage during the winter months due to stuck valves or improper setpoints!

Humidity control and chilled water - When you inspect your steam or hot water valves at your coils, you should also inspect your chilled water valves. It is common for buildings to have humidity control on their coils to maintain a steady level of humidity year-round. You may want to review the operation of your humidity controls to make certain they are not causing an increase in chilled water usage during the heating season. We have seen some buildings with both high steam and chilled water usage during the winter months due to faulty humidity control or chilled water control valves. The last thing you want to do is to pay for steam that you're using to heat the air that you just cooled with the chilled water that you just bought! Under this scenario, you will end up paying twice for the energy - once for the chilled water to cool the air and second for the steam to heat it back up!

Fan belts - Most fan coil units and air handlers have belt-driven fans. Fan belts become frayed or stretched over time causing slippage between the motor and fan pulleys. This slippage can result in a reduced fan speed, which will reduce the volume of air flowing through the fan. When this begins to occur, you may begin to notice that your air-side temperatures are becoming too hot or too cold, and you may begin to loose control over the air temperature completely. With damaged or broken fan belts, the motor drives continue to use electricity but will result in less air flow, thus the efficiency of your operation begins to decline. Regularly check your fan belts and replace broken or damaged belts to keep your system working properly!

Air filters - Air filters, as we all know, should be checked and replaced regularly. As they

become clogged, they introduce restrictions in the air-side flows across your coils. These restrictions may cause an increase in the electrical energy required by your fan. You may also begin to experience a loss of control of the air-side temperatures. In addition with dirty or missing filters, dirt and debris may find their way to the face of your coils. With dirty coils, the air-side flow rate will become restricted, but you may also experience a decrease in heat transfer, thus causing a loss of air-side temperature control. In addition, cleaning your coils can be expensive. Check your air filters regularly and replace them as necessary!

Water chemistry for closed-loop hot water systems - If your building operates with a closed-loop hot water system, you may be familiar with the issues surrounding water chemistry. The hot water you have circulating throughout your building can cause corrosion to coils and piping, but the main problem is the formation of deposits on your coils due to poor water treatment of the city water make-up. These deposits can cause a substantial decrease in the ability to transfer heat in your steam-to-hot water heat exchangers and in your heating coils at your air handlers and fan coil units. These problems can cause an increase in steam flow to heat the same amount of hot water flow due to an inability to achieve your air temperature setpoint. You may also begin to be unable to meet the same old air temperature setpoints due to the restrictions on heat transfer. In addition, you may begin to require more pumping energy to circulate enough hot water through your coils to heat the air to the temperature you need. Never underestimate water chemistry; it is very, very important!

Staging equipment - Although not necessarily a source of energy loss, opening valves quickly or starting many pieces of equipment at once can cause a momentary jump in your steam (or chilled water) demand. These spikes in demand can cause your monthly demand to exceed your contract demand. When this occurs, your demand could be adjusted to a higher value (based on the magnitude of the demand excursion) for the next twelve months! Opening valves quickly, especially main steam valves, have a tendency to allow a tremendous amount of steam to pass - especially if your building is cold and your control valves are all open! You can potentially avoid a demand adjustment by staging your air handlers, fan coils and pumps over the course of thirty minutes to one hour. In addition, never ever open your main steam valve, or any valve, quickly. Slowly open your valves, either manually or your control valves, to result in a slow warming of your system over the course of at least one hour, if not longer.